

## ABSTRACT

A compact quench box design for a multi-bed, mixed-phase cocurrent downflow fixed-bed reactor has a quench pipe manifold and nozzle assembly, a collection tray, a mixing chamber, and a single final distributor tray. The quench pipe manifold and nozzle assembly is an annular ring pipe having nozzles arising therefrom. The mixing chamber is an annular compartment depending from the collection tray above having a partition pan, forming a partition weir at its inside diameter for liquid to flow, and a bottom section pan, which forms a vapor outlet weir at its inside diameter for vapor flow onto the final distributor tray below. This design reduces the number of manway required for the quench box.